REMARKS

The Office Action dated September 5, 2003 has been reviewed. Applicant has amended claim 17. Claims 17-29 are pending, and are respectfully submitted for reconsideration by the Examiner.

Claims 17, 20, 21, and 23-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,869,744 to Suzuki et al. ("Suzuki") in view of U.S. Patent No. 4,963,246 to Nakajima et al. ("Nakajima"). Claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki in view of Nakajima, and further in view of U.S. Patent No. 4,668,873 to Ohba et al. ("Ohba"). Claim 19 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki in view of Nakajima, and further in view of U.S. Patent No. 5,161,087 to Frankeny et al. ("Frankeny"). Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki in view of Nakajima, and further in view of U.S. Patent No. 5,024,534 to Matsubara et al. ("Matsubara").

The rejection under 35 U.S.C. § 103(a), of claim 17, is respectfully traversed. Applicant has amended claim 17 to recite a control system for an internal combustion engine. The control system includes a nitrogen oxide sensor, a connecting line for transmission via an interface of data from the nitrogen oxide sensor to an evaluating unit for digitization of the data, and a connecting line for transmission of the digitized data from the evaluating unit to an engine control device. The interface is a plug connector in the housing of which the evaluating unit is integrated.

The measurement range of nitrogen oxide sensors goes down to 10 parts-per-million, thus requiring small currents on the order of 50 nano-Amperes to be detected. Only extremely low parasitic conductances or leakage resistances may occur, if current measurements on the order of 50 nA are to be achieved. In order to minimize transmission interference, the interface is a plug connector that is integrated in the housing of the evaluating unit, as recited in claim 17, which allows the connecting line for transmission of data from the nitrogen oxide sensor to the interface to extend a short distance. The connecting line for transmission of the data from the evaluating unit to an engine control device may be longer because the data is digitized by the evaluating

unit, and the digitized data is less susceptible to transmission interferences. Support for these features is provided at, for example, page 1, ll. 8-15, and page 4, ll. 15-17.

The Office Action states that Suzuki shows a control device 25 providing an interface with sensor 17 and includes a control block 69 for digitization of data to be transmitted to an electronic control unit 5. Applicant submits that figure 1 of Suzuki shows only a block diagram made up of functional groups. These groups have no connection with an actual technical implementation. Suzuki shows only a process for operating an oxygen probe, and not an actual device, and therefore does not teach the particulars of the control system recited in claim 17. Moreover, the sensor 17 of Suzuki is an oxygen probe. In as much as the magnitude of the signals of an oxygen probe is $\pm$ 50 milli-Amperes, there is no need to limit physical separation between the oxygen sensor 17 and control device 25, nor is there any reason to separate the structure of analysis unit 25 and the structure of ECU 5, i.e. resolution of the signal from the oxygen sensor 17 is unaffected by a single, long connector with the combined control device 25 and ECU 5. There is no recognition of the problem solved by Applicants' invention because the process described in Suzuki for operating an oxygen probe simply does not require the precision measurement that is required by Applicant's claimed nitrogen oxide sensor. As such, Suzuki does not give any indication for possible technical realization of the kind of measurement resolution achieved by the instant invention. Thus, Suzuki does not teach or suggest at least the features of a control system having a nitrogen oxide sensor and an interface being a plug connector in the housing of which the evaluating unit is integrated, as recited in claim 17.

Nakajima fails to cure the above-identified deficiencies of Suzuki. Like Suzuki, Nakajima shows an oxygen sensor, and not a nitrogen oxide sensor. Moreover, Nakajima in FIG. 3 shows a coupler 100 with a portion 100a on the sensor 1 side and a second portion 100b on the electronic control unit (ECU) 4 side. Both portions 100a, 100b are connected to establish an electrical connection. The coupler 100 provides an electrical connection and does not include structures to digitize the data from sensor 1 for transmission to ECU 4. The resistance 124 in the connector part 100a does not influence the signal coming from the sensor 1 in any way. The resistance 124 serves only to supply a signal to the ECU and hence to its associated analysis unit by which the analysis unit can calibrate the sensor. Resistance 124 is not electrically connected to the sensor lines. Instead, Nakajima shows in FIG. 2 that the ECU 4 includes a pair of analog-

to-digital (A/D) converters 401,406 (col. 9, lines 41-53). That is, Nakajima specifically provides A/D converters separate from the housing of coupler 100. Applicant respectfully submits that one having ordinary skill in the art would not be motivated to modify Suzuki in view of Nakajima because Nakajima specifically provides structure for digitizing data separate from the housing of coupler 100.

Further, assuming *arguendo* Suzuki could be modified as proposed by the Office Action, Applicant respectfully submits that a modification of Suzuki with the coupler 100 of Nakajima could render Suzuki unsatisfactory for its intended purpose. That is, if the control device 25 of Suzuki were modified by the teachings of Nakajima regarding coupler 100, then the oxygen concentration-detecting device of Suzuki would not be able to transmit "digitized" data from the plug connector to the electronic control unit 5. MPEP § 2143.01 states if a proposed modification renders the invention disclosed in the reference unsatisfactory for its intended purpose, then there is no suggestion or motivation to combine references.

At least for the above-described reasons, Applicant requests that the rejection under 35 U.S.C. § 103(a), of claim 17, be withdrawn.

It is submitted that neither Ohba, Frankeny, nor Matsubara, overcome the above-described deficiencies of Suzuki and Nakajima. Claims 18-29 ultimately depend from claim 17, and recite the same combination of allowable features that are recited in claim 17, as well as additional features that further define over the applied references. Accordingly, Applicant requests that the rejections under 35 U.S.C. § 103(a), of claims 18-29, be withdrawn as well.

Applicant respectfully requests that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing all pending claims in condition for allowance. Applicant submits that the claim amendments do not introduce new matter.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite the prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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